

In the Claims

Claim 1 (Currently Amended): An image data sorting device comprising:

a characteristic value extraction unit that extracts ~~[[a]]~~ characteristic ~~value~~ values of an image data piece from the image data ~~piece~~ pieces,

wherein extracted characteristic values are expressed in I_j dimensional vector ($j = 1, 2, \dots, n$, here $1 \leq I_j, 1 \leq n$) in which n types of characteristic value vectors are obtained;

a relation evaluation unit that evaluates a mutual relation between the characteristic ~~values~~ value vectors that the characteristic value extraction unit extracts from plural image data pieces;

a clustering unit that executes clustering to events expressed by the characteristic ~~values~~ value vectors of the plural image data pieces on the basis of an evaluation result of the relation acquired by the relation evaluation unit; and

a sorting register unit that automatically sorts the plural image data pieces on the basis of a result of clustering by the clustering unit.

Claim 2 (Currently Amended): An image data sorting device according to Claim 1, wherein:

the characteristic extraction unit extracts~~[[,]]~~ the n types of characteristic value vectors as the characteristic value of the image data~~[[,]]~~; and ~~n types of characteristic value vectors by an I_j dimensional vector ($j = 1, 2, \dots, n$, here $1 \leq I_j, 1 \leq n$) from the image data; and~~

the relation evaluation unit, synthesizing the n types of the characteristic value vectors as to each of the n types of ~~the~~ characteristic value vectors that the characteristic value extraction

unit extracts from the plural image data pieces, evaluates the relation between the image data pieces ~~in a~~ based on synthesis result.

Claim 3 (Original): An image data sorting device according to Claim 1, wherein the clustering unit executes clustering by means of a non-hierarchical method based on a cluster number.

a¹ Claim 4 (Original): An image data sorting device according to Claim 1, wherein the clustering unit executes by means of a hierarchical method that joins clusters on the basis of the relation between the clusters.

Claim 5 (Currently Amended): An image data sorting device according to Claim 1, wherein the clustering unit executes clustering by means of a fuzzy technique that employs ~~the~~ a fuzzy theory.

Claim 6 (Currently Amended): An image data sorting device according to Claim 1, wherein the clustering unit executes clustering by means of a crisp technique that does not employ ~~the~~ a fuzz theory.

Claim 7 (Original): An image data sorting device according to Claim 1, wherein the clustering unit includes a cluster number specifying unit that specifies a cluster number when executing clustering.

Claim 8 (Original): An image data sorting device according to Claim 1, further comprising:

an image storage unit that stores plural image data pieces; and

an image management unit that manages the plural image data pieces stored in the image storage unit on the basis of a sorting result by the sorting register unit.

a¹ Claim 9 (Original): An image data sorting device according to Claim 8, wherein the image management unit manages the plural image data pieces stored in the image storage unit on the basis of the sorting result by the sorting register unit and attribute information relating to the image data pieces, which are given to the plural image data pieces.

Claim 10 (Original): An image data sorting device according to Claim 8, wherein, when the image storage unit stores a specific number of image data pieces, the clustering unit and the sorting register unit execute clustering and sorting of the image data pieces stored in the image storage unit.

Claim 11 (Original): An image data sorting device according to Claim 8, wherein the clustering unit and the sorting register unit execute clustering and sorting of the image data pieces stored in the image storage unit each time a specific period of time passes.

Claim 12 (Original): An image data sorting device according to Claim 8, wherein, when there is a new image data piece to be stored in the image storage unit after clustering and sorting of the image data pieces stored in the image storage unit, the clustering unit and the sorting register unit execute sorting of the new image data pieces in such a manner that the new image data piece belongs to a cluster having the highest relation among existing clusters relating to the image data pieces stored in the image storage unit.

a | Claim 13 (Original): An image data sorting device according to Claim 12, wherein the clustering unit and the sorting register unit execute sorting of the new image data piece on the basis of the relation with the characteristic value acquired from the center of gravity of the existing clusters relating to the image data pieces stored in the image storage unit.

Claim 14 (Original): An image data sorting device according to Claim 12, wherein the clustering unit and the sorting register unit execute sorting of the new image data piece on the basis of a center value of the relations between the characteristic value of the new image data piece and the characteristic values of the image data pieces each stored in the image storage unit.

Claim 15 (Original): An image data sorting device according to Claim 8, wherein, when more than a specific number of image data pieces are added in the image storage unit after sorting by the sorting register unit, the clustering unit and the sorting register unit destroy the existing sorting and execute clustering and sorting of all of the image data pieces stored in the image storage unit.

Claim 16 (Original): An image data sorting device according to Claim 8, wherein, when a specific time passes after sorting by the sorting register unit, the clustering unit and the sorting register unit destroy the existing sorting and execute clustering and sorting of all of the image data pieces stored in the image storage unit.

a¹ Claim 17 (Currently Amended): An image data sorting device according to Claim 1, further comprising an image output unit that outputs image data pieces located near the center of each cluster, ~~of the image data pieces after~~ upon completion of clustering by the clustering unit and sorting by the sorting register unit having been executed.

Claim 18 (Currently Amended): An image data sorting device according to Claim 1, further comprising an image output unit that outputs image data pieces having a high relation with image data pieces located near the center of each cluster, ~~of the image data pieces after~~ upon completion of clustering by the clustering unit and sorting by the sorting register unit having been executed.

Claim 19 (Original): An image data sorting device according to Claim 17, wherein the image output unit outputs only the image data pieces relating to a designated cluster.

Claim 20 (Original): An image data sorting device according to Claim 17, wherein, after clustering by the clustering unit and sorting by the sorting register unit have been executed, when clustering by the clustering unit and sorting by the sorting register unit are executed again, the image output unit again outputs image data pieces after being sorted again.

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Claim 21 (Currently Amended): An image data sorting method comprising the steps of:
extracting ~~[[a]]~~ characteristic ~~value~~ values of an image data piece from the image data
~~piece~~ pieces[[;]],

wherein, extracted characteristic values are expressed in I_j dimensional vector ($j = 1, 2, \dots, n$, here $1 \leq I_j, 1 \leq n$) in which n types of characteristic value vectors are obtained;

~~when extracting characteristic values from plural image data pieces,~~
evaluating a mutual relation between each of the n types of characteristic ~~values~~ value
vectors;

executing clustering to events expressed by the n types of characteristic ~~values~~ value
vectors of the plural image data pieces on the basis of an evaluation result of the relation; and

automatically sorting the plural image data pieces on the basis of a result of the
clustering.

Claim 22 (Currently Amended): An image data sorting method comprising the steps of:
extracting n types of characteristic value vectors expressed by an I_j dimensional vector ($j = 1, 2, \dots, n$, here $1 \leq I_j, 1 \leq n$) from image data pieces;

~~when extracting n types of the characteristic value vectors from plural image data pieces,~~

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synthesizing the n types of ~~the~~ characteristic value vectors ~~as~~ to each of the n types of ~~the~~ characteristic value vectors, and evaluating a mutual relation between the image data pieces ~~in a~~ based on synthesis result;

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executing clustering to the characteristic value vectors of the plural image data pieces in accordance with an evaluation result of the relation; and

automatically sorting the plural image data pieces on the basis of a result of the clustering.
